

Patent claims

1. Water-thinnable polyurethane with at least two free OH groups obtainable from a first conversion of a primary and/or secondary alkanolamine with a NCO compound giving an intermediate product, followed by the addition of a cyclic carboxylic anhydride to the intermediate product; with
 - the NCO compound exhibiting at least one free NCO group and no blocked NCO group;
 - all alkanolamine being converted during the first conversion to the intermediate product such that the nitrogen atom of the alkanolamine reacts with one of the free NCO groups of the prepolymer to form a urea bond; and
 - the cyclic carboxylic anhydride reacting, with ring opening, with the OH group, originating from the alkanolamine, of the intermediate product.
2. Water-thinnable polyurethane according to claim 1 characterised in that the NCO compound does not exhibit any OH group.
3. Water-thinnable polyurethane according to claim 1 or 2 characterised in that the NCO compound is modified by at least one alkoxypoly(oxyalkylene) alcohol.
4. Water-thinnable polyurethane according to one of the preceding claims characterised in that the NCO compound is a prepolymer.
5. Water-thinnable polyurethane according to one of the preceding claims characterised in that the NCO compound exhibits at least two free NCO groups.
6. Water-thinnable polyurethane according to one of the preceding claims characterised in that at least one OH group of the alkanolamine is linked with its nitrogen atom via a substituted or non-substituted alkyl group with 2 to 6 carbon atoms in the main chain.
7. Water-thinnable polyurethane according to one of the preceding claims characterised in that OH groups originating from the alkanolamine are fully or partially secondary.

8. Water-thinnable polyurethane according to one of the preceding claims characterised in that alkanolamine is diethanolamine and/or diisopropanolamine.
- 5 9. Water-thinnable polyurethane according to one of the preceding claims characterised in that it has an acid number of at least 10 mg KOH/g, in particular of at least 20 mg KOH/g.
- 10 10. Water-thinnable polyurethane according to one of the preceding claims characterised in that the polyurethane has a number average molecular weight of between 500 and 10,000, in particular between 1,000 and 4,000.
- 15 11. Water-thinnable polyurethane according to one of the preceding claims characterised in that the cyclic carboxylic anhydride is selected from the group of phthalic anhydride, hexahydrophthalic anhydride, tetrahydrophthalic anhydride, methyl hexahydrophthalic anhydride, succinic anhydride and maleic anhydride.
- 20 12. Water-thinnable polyurethane according to one of claims 1 to 10 characterised in that the cyclic carboxylic anhydride is trimellithic anhydride.
- 25 13. Use of a water-thinnable polyurethane according to one of the preceding claims in combination with a melamine resin for the production of hot curing coating compositions.
- 30 14. Use of a water-thinnable polyurethane according to claim 13 characterised in that the melamine resin is a highly alkylated melamine resin.
15. Use according to claim 14 characterised in that the melamine resin is one without NH groups, in particular hexamethoxymethyl melamine (HMMA).
16. Use according to one of claims 13 to 15 characterised in that the crosslinking temperature is less than 145°C.
- 35 17. Use according to one of claims 13 to 16 characterised in that the crosslinking temperature is more than 180°C.

18. Use of a water-thinnable polyurethane according to one of the preceding claims for the production of coating compositions, in particular of fillers in the motor vehicle industry.